

REPORT NUMBER: 301SB-MGA-2011-001

**SAFETY COMPLIANCE TESTING FOR
FMVSS NO. 301
FUEL SYSTEM INTEGRITY**

**2011 STARCRAFT QUEST SCHOOL BUS
NHTSA NO.: CB0902**

**PREPARED BY:
MGA RESEARCH CORPORATION
5000 WARREN ROAD
BURLINGTON, WI 53105**



TEST DATE: OCTOBER 13, 2011

FINAL REPORT DATE: DECEMBER 13, 2011

FINAL REPORT

**PREPARED FOR:
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NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION
ENFORCEMENT
OFFICE OF VEHICLE SAFETY COMPLIANCE
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16. Abstract A compliance test was conducted on the subject 2011 Starcraft Quest School Bus, NHTSA No. CB0902 in accordance with the specifications of the Office of Vehicle Safety Compliance Test Procedure No. TP-301-04 for the determination of FMVSS 301 compliance. Test failures identified were as follows: None			
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SECTION 1
PURPOSE OF COMPLIANCE TEST AND SUMMARY

A fuel system integrity test was performed on a MY2011 Starcraft Quest School Bus, NHTSA No. CB0902, in accordance with the specifications of the Office of Vehicle Safety Compliance (OVSC) Test Procedure TP-301-04, to determine compliance to the requirements of Federal Motor Vehicle Safety Standards (FMVSS) 301, "Fuel System Integrity".

Based on the test results, the MY2011 Starcraft Quest School Bus, NHTSA No. CB0902 appears to meet the requirements of FMVSS 301 testing.

This program is sponsored by the National Highway Traffic Safety Administration (NHTSA), under Contract No. DTNH22-08-D-00075.

SECTION 2
COMPLIANCE TEST DATA

The following data sheets document the results of testing on the MY2011 Starcraft Quest School Bus, NHTSA No. CB0902.

DATA SHEET 1
SCHOOL BUS DATA

Test Vehicle: **2011 Starcraft Quest SCHOOL BUS**
Test Lab: **MGA Research Corporation**

NHTSA No.: **CB0902**
Test Date: **10/13/11**

GENERAL VEHICLE IDENTIFICATION

School Bus Manufacturer	Forest River, Inc.	
School Bus Model	Starcraft Quest	
Build Date	11/10	
Incomplete Vehicle Manufactured By	Chevrolet	
Build Date for Bus Chassis	10/10	
School Bus GVWR (kg)	5,579 kg / 12,300 lb	
School Bus GAWR Front (kg)	1,950 kg / 4,300 lb	
School Bus GAWR Rear (kg)	3,901 kg / 8,600 lb	
School Bus VIN	1GB3G3BG2B1112157	
No. of Designated Seating Positions (DSP) including Driver	29	
School Bus NHTSA No.	CB0902	
Bus Body Color	Yellow	
No. of Cylinders	8	
Engine Displacement (L)	6.0 – Longitudinal	
Fuel Pump Actuation	Electrical – Pump “ON” With Ignition	
School Bus Width (mm)	2,484	
School Bus Length (mm)	6,743	
Bus Unloaded Vehicle Weight (UVW) (kg)	3,683.2	
Bus Occupant Load	1,512 kg - Passenger 68 kg - Driver 1,580 kg - Total	
Target Bus Test Weight (SBTW) (kg)	5,263.2	
Actual (SBTW) (kg)	5,261.0	
School Bus Tire Manufacturer	Uniroyal	
	Front	Rear
Rec. Cold Tire Inflation Pressure (KPa)	448	448
Tire Size	LT225/75R16E – 115/112S	LT225/75R16E – 115/112S
Load Range	E	E

**DATA SHEET 1
SCHOOL BUS DATA**

GENERAL VEHICLE IDENTIFICATION

SCHOOL BUS ATTITUDE

	Units	LF	RF	LR	RR
Pre-Test (As Received)	mm	854	855	800	800
Post Test	mm	885	818	813	726

FUEL TANK CAPACITY INFORMATION

Fuel Tank Capacity (liters)	123.8
Tank Test Volume (liters)	113.9

TEST VEHICLE WEIGHTS

	Units	As Delivered			As Tested		
		Front	Rear	Total	Front	Rear	Total
Left	kg	816.5	1,031.9		956.5	1,710.0	
Right	kg	814.2	1,020.6		908.0	1,686.5	
Ratio	%	44.3	55.7		35.4	64.5	
Totals	kg	1,630.7	2,052.5	3,683.2	1,864.5	3,396.5	5,261.0

COMMENTS: NONE

Recorded By: *Eva Leebman*

Approved By: *Michael Janoy*

Date: 10/13/11

DATA SHEET 2
SCHOOL BUS IMPACT DATA

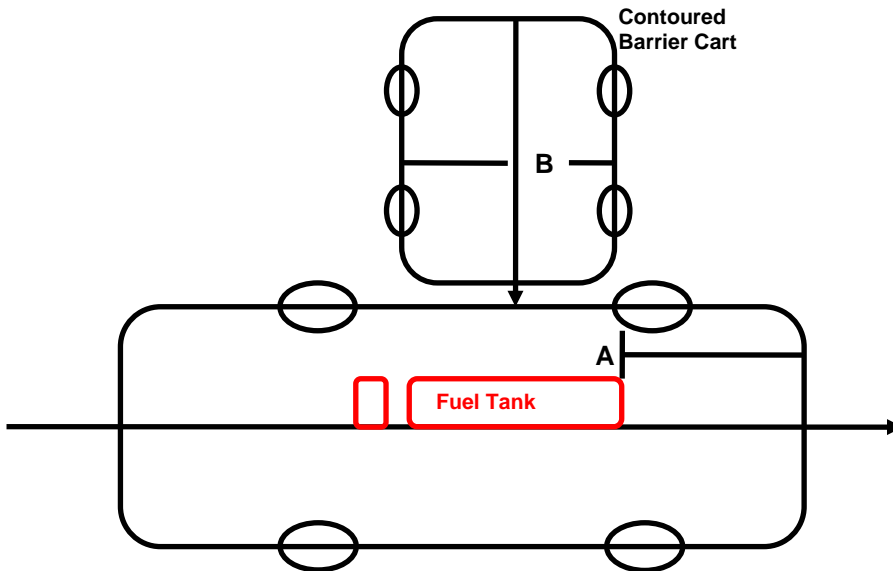
Test Vehicle: **2011 Starcraft Quest SCHOOL BUS**
Test Lab: **MGA Research Corporation**

NHTSA No.: **CB0902**
Test Date: **10/13/11**

IMPACT INFORMATION

Time of Impact	09:19 AM
Ambient Temperature (°C)	21
Barrier Velocity – Speed Trap 1 (kph)	47.6
Barrier Velocity – Speed Trap 2 (kph)	47.6
Barrier Penetration	341 mm

INDICATE IMPACT POINT BELOW:



LEGEND: Arrow indicates point and angle of barrier impact (C_L of arrow coincides with C_L of monorail).

DESCRIPTION: Fuel tank is located on the centerline of the vehicle, just rearward of the rear Axle.


DATA SHEET 2
SCHOOL BUS IMPACT DATA


Fuel Spillage Noted	No
Failure, if applicable	None

STODDARD SOLVENT SPILLAGE MEASUREMENTS

Timeframe	Description	Allowable Spillage	Measured Spilled	Results
T ₀ – T ₁	Time Zero to Cessation of Motion	31 grams (1 ounce)	0	PASS
T ₁ – T ₂	Cessation of Motion to 5 minutes after Cessation of Motion	156 grams (5 ounces)	0	PASS
T ₂ – T ₃	5 Minutes after Cessation of Motion to 30 minutes after Cessation of Motion	28 grams (1 ounce) per minute 775 grams (25 ounces) Total Allowed	0	PASS

COMMENTS: None

Recorded By: 

Approved By: 

Date: 10/13/11

SECTION 3
INSTRUMENTATION AND EQUIPMENT LIST

Equipment	Manufacturer	Serial No.	Cal. Date	Next Cal. Date
Counter/Timer	Newport	5080708	4/21/11	10/21/11
Counter/Timer	Newport	4470268	4/21/11	10/21/11
Vehicle Scales	Intercomp	SW500	6/1/11	12/1/11
Tape Measure	Stanley Powerlock	551	8/19/11	2/19/12

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Test Vehicle: 2011 Starcraft Quest School Bus NHTSA No.: CB0902
 Test Lab: MGA Research Corporation Test Date: 10/13/11

STARCRAFT BUS

a division of Forest River, Inc.

COMPLETED VEHICLE MANUFACTURED BY:

Starcraft Bus a Division of Forest River, Inc.
 2376 Century Drive, Goshen, IN 46528
 Phone: 800-348-7440

Date of Manufacture: Nov-10

INCOMPLETE VEHICLE MANUFACTURED BY:

Chevrolet
 1500 East Route A, Wentzville, MO 63385
 Phone: 586-492-7440
 Date of Manufacture: Oct-10
 GVWR: 12300

GAWR Front: 4300 With LT225/75R16E Tires 16 X 6.5J Rims @ 65 PSI Cold SINGLE

GAWR Rear: 8600 With LT225/75R16E Tires 16 X 6.5J Rims @ 65 PSI Cold DUAL

VIN: 1GB3G3BG2B1112157

VEHICLE TYPE: STARCRAFT SCHOOL BUS/QUEST

VEHICLE MAKE: Chevrolet

MODEL NUMBER: ETD021727

GROSS VEHICLE WEIGHT: 8174

Maximum Permitted Seated Passenger: 28

Actual Configured Seating Capacity: 28

Maximum Permitted W/C Passengers: 0

Actual Configured W/C Capacity: 0

Approval Numbers
MIDWEST TRANSIT

THIS VEHICLE CONFORMS TO ALL APPLICABLE U.S. FEDERAL MOTOR VEHICLE SAFETY STANDARDS IN EFFECT ON THE DATE OF MANUFACTURE SHOWN ABOVE.

Test Vehicle: 2011 Starcraft Quest School Bus
 Test Lab: MGA Research Corporation

NHTSA No.: CB0902
 Test Date: 10/13/11

E1D0217Z1

THIS VEHICLE CONFORMS TO ALL APPLICABLE U.S. FEDERAL MOTOR VEHICLE SAFETY STANDARDS IN EFFECT ON THE DATE OF MANUFACTURE SHOWN ABOVE.

THIS VEHICLE CONFORMS TO ALL APPLICABLE STANDARDS PRESCRIBED UNDER THE CANADIAN MOTOR VEHICLE SAFETY REGULATIONS IN EFFECT ON THE DATE OF MANUFACTURE.

CE VEHICULE EST CONFORME A TOUTES LES NORMES QUI SONT APPLICABLES EN VERTU DU REGLEMENT SUR LA SECURITE DES VEHICLES AUTOMOBILES DU CANADA EN VIGEUR A LA DATE DE SA FABRICATION.

INC. VEL. MFG. BY: Chevrolet

DATE: 11/1/2010

MANUFACTURED BY / FABRIQUE PAR: FOREST RIVER, Inc

VIN: 5NHSET326BD021727 1GB3G3BG2B112157 ST6917SC

GWR/PBW: 5579KG (12300LB) TYPE/TYPE: STARCRAFT SCHOOL BUS/QUEST

DESIG. SEAT CAP./NOMBRE D'ESIGNE' DE PLACES ASSISES 28X54kg=1582 kg or 28X120lbs=3510 lb

CAVARDAGE	TIRE/NEU	ROUS/QUANTE	COOL INFL. PRESS/PRESS DE GONFL. A FROID
FRONT / AVANT () 1950 KG 4300 LB	LT225/75R16E	16 X 6.5J	448 kPa () SINGLE <input checked="" type="checkbox"/> DUAL <input type="checkbox"/> 65 PSILP
INTERM / INTERM () 0 KG 0 LB			0 kPa () SINGLE <input checked="" type="checkbox"/> DUAL <input type="checkbox"/> 0 PSILP
REAR / ARRIERE () 3901 KG 8600 LB	LT225/75R16E	16 X 6.5J	448 kPa () SINGLE <input type="checkbox"/> DUAL <input checked="" type="checkbox"/> 65 PSILP

Incomplete Vehicle Label

Test Vehicle: 2011 Starcraft Quest School Bus NHTSA No.: CB0902
Test Lab: MGA Research Corporation Test Date: 10/13/11



Pre-Test Front View of School Bus (Receiving Photograph)

Test Vehicle: 2011 Starcraft Quest School Bus NHTSA No.: CB0902
Test Lab: MGA Research Corporation Test Date: 10/13/11



Pre-Test Left Front Three-Quarter View of School Bus (Receiving Photograph)

Test Vehicle: 2011 Starcraft Quest School Bus NHTSA No.: CB0902
Test Lab: MGA Research Corporation Test Date: 10/13/11



Pre-Test Right Front Three-Quarter View of School Bus (Receiving Photograph)

Test Vehicle: 2011 Starcraft Quest School Bus NHTSA No.: CB0902
Test Lab: MGA Research Corporation Test Date: 10/13/11



Pre-Test Left Side View of School Bus (Receiving Photograph)

Test Vehicle: 2011 Starcraft Quest School Bus NHTSA No.: CB0902
Test Lab: MGA Research Corporation Test Date: 10/13/11



Pre-Test Right Side View of School Bus (Receiving Photograph)

Test Vehicle: 2011 Starcraft Quest School Bus
Test Lab: MGA Research Corporation

NHTSA No.: CB0902
Test Date: 10/13/11



Pre-Test Rear View of School Bus (Receiving Photograph)

Test Vehicle: 2011 Starcraft Quest School Bus
Test Lab: MGA Research Corporation

NHTSA No.: CB0902
Test Date: 10/13/11



Pre-Test Left Rear Three-Quarter View of School Bus (Receiving Photograph)

Test Vehicle: 2011 Starcraft Quest School Bus NHTSA No.: CB0902
Test Lab: MGA Research Corporation Test Date: 10/13/11



Pre-Test Right Rear Three-Quarter View of School Bus (Receiving Photograph)

Test Vehicle: 2011 Starcraft Quest School Bus
Test Lab: MGA Research Corporation

NHTSA No.: CB0902
Test Date: 10/13/11



Pre-Test Cart Positioned by School Bus (Rear View)

Test Vehicle: 2011 Starcraft Quest School Bus
Test Lab: MGA Research Corporation

NHTSA No.: CB0902
Test Date: 10/13/11



Post-Test Cart and School Bus (Rear View)

Test Vehicle: 2011 Starcraft Quest School Bus NHTSA No.: CB0902
Test Lab: MGA Research Corporation Test Date: 10/13/11



Pre-Test Cart Positioned by School Bus (Side Close-up View)

Test Vehicle: 2011 Starcraft Quest School Bus NHTSA No.: CB0902
Test Lab: MGA Research Corporation Test Date: 10/13/11



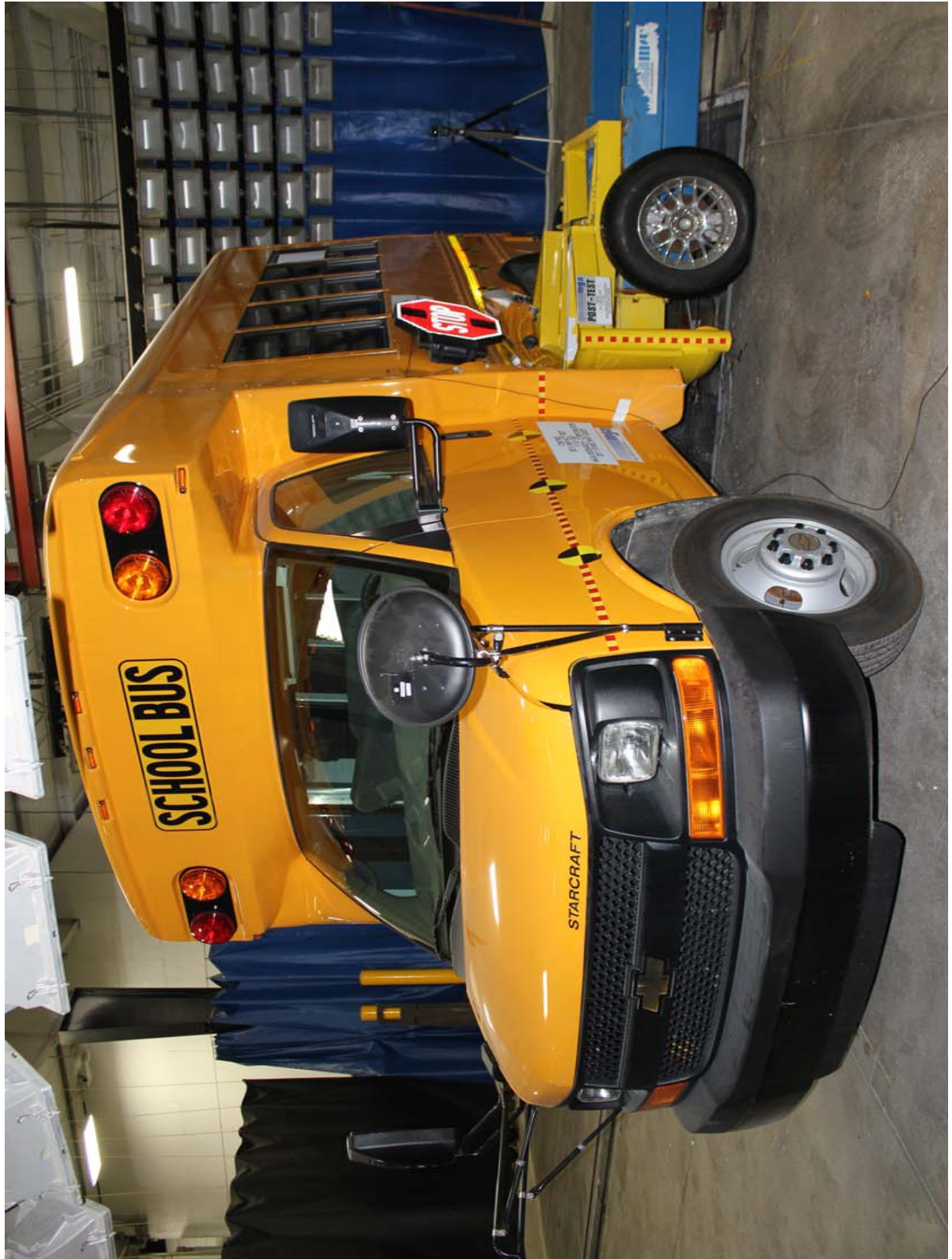
Post-Test Cart and School Bus (Side Close-up View)

Test Vehicle: 2011 Starcraft Quest School Bus NHTSA No.: CB0902
Test Lab: MGA Research Corporation Test Date: 10/13/11



Pre-Test Cart Positioned by School Bus (Front View)

Test Vehicle: 2011 Starcraft Quest School Bus NHTSA No.: CB0902
Test Lab: MGA Research Corporation Test Date: 10/13/11



Post-Test Cart and School Bus (Front View)

Test Vehicle: 2011 Starcraft Quest School Bus NHTSA No.: CB0902
Test Lab: MGA Research Corporation Test Date: 10/13/11



Test Vehicle: 2011 Starcraft Quest School Bus NHTSA No.: CB0902
Test Lab: MGA Research Corporation Test Date: 10/13/11



Post-Test Impact View 2

Test Vehicle: 2011 Starcraft Quest School Bus
Test Lab: MGA Research Corporation

NHTSA No.: CB0902
Test Date: 10/13/11



Post-Test Impact Close-up View 1

Test Vehicle: 2011 Starcraft Quest School Bus NHTSA No.: CB0902
Test Lab: MGA Research Corporation Test Date: 10/13/11



Post-Test Impact Close-up View 2

Test Vehicle: 2011 Starcraft Quest School Bus NHTSA No.: CB0902
Test Lab: MGA Research Corporation Test Date: 10/13/11



Post-Test Impact Close-up View 3

Test Vehicle: 2011 Starcraft Quest School Bus NHTSA No.: CB0902
Test Lab: MGA Research Corporation Test Date: 10/13/11



Post-Test Left Front Three-Quarter View of School Bus Without Cart

Test Vehicle: 2011 Starcraft Quest School Bus NHTSA No.: CB0902
Test Lab: MGA Research Corporation Test Date: 10/13/11



Post-Test Left Rear Three-Quarter View of School Bus Without Cart

Test Vehicle: 2011 Starcraft Quest School Bus NHTSA No.: CB0902
Test Lab: MGA Research Corporation Test Date: 10/13/11



Pre-Test Fuel Filler Cap

Test Vehicle: 2011 Starcraft Quest School Bus NHTSA No.: CB0902
Test Lab: MGA Research Corporation Test Date: 10/13/11



Post-Test Fuel Filler Cap

Test Vehicle: 2011 Starcraft Quest School Bus
Test Lab: MGA Research Corporation

NHTSA No.: CB0902
Test Date: 10/13/11



Pre-Test Fuel Tank View 1

Test Vehicle: 2011 Starcraft Quest School Bus
Test Lab: MGA Research Corporation

NHTSA No.: CB0902
Test Date: 10/13/11



Post-Test Fuel Tank View 1

Test Vehicle: 2011 Starcraft Quest School Bus NHTSA No.: CB0902
Test Lab: MGA Research Corporation Test Date: 10/13/11



Pre-Test Fuel Tank View 2

Test Vehicle: 2011 Starcraft Quest School Bus NHTSA No.: CB0902
Test Lab: MGA Research Corporation Test Date: 10/13/11



Post-Test Fuel Tank View 2

Test Vehicle: 2011 Starcraft Quest School Bus
Test Lab: MGA Research Corporation

NHTSA No.: CB0902
Test Date: 10/13/11



Pre-Test Fuel Tank View 3

Test Vehicle: 2011 Starcraft Quest School Bus NHTSA No.: CB0902
Test Lab: MGA Research Corporation Test Date: 10/13/11



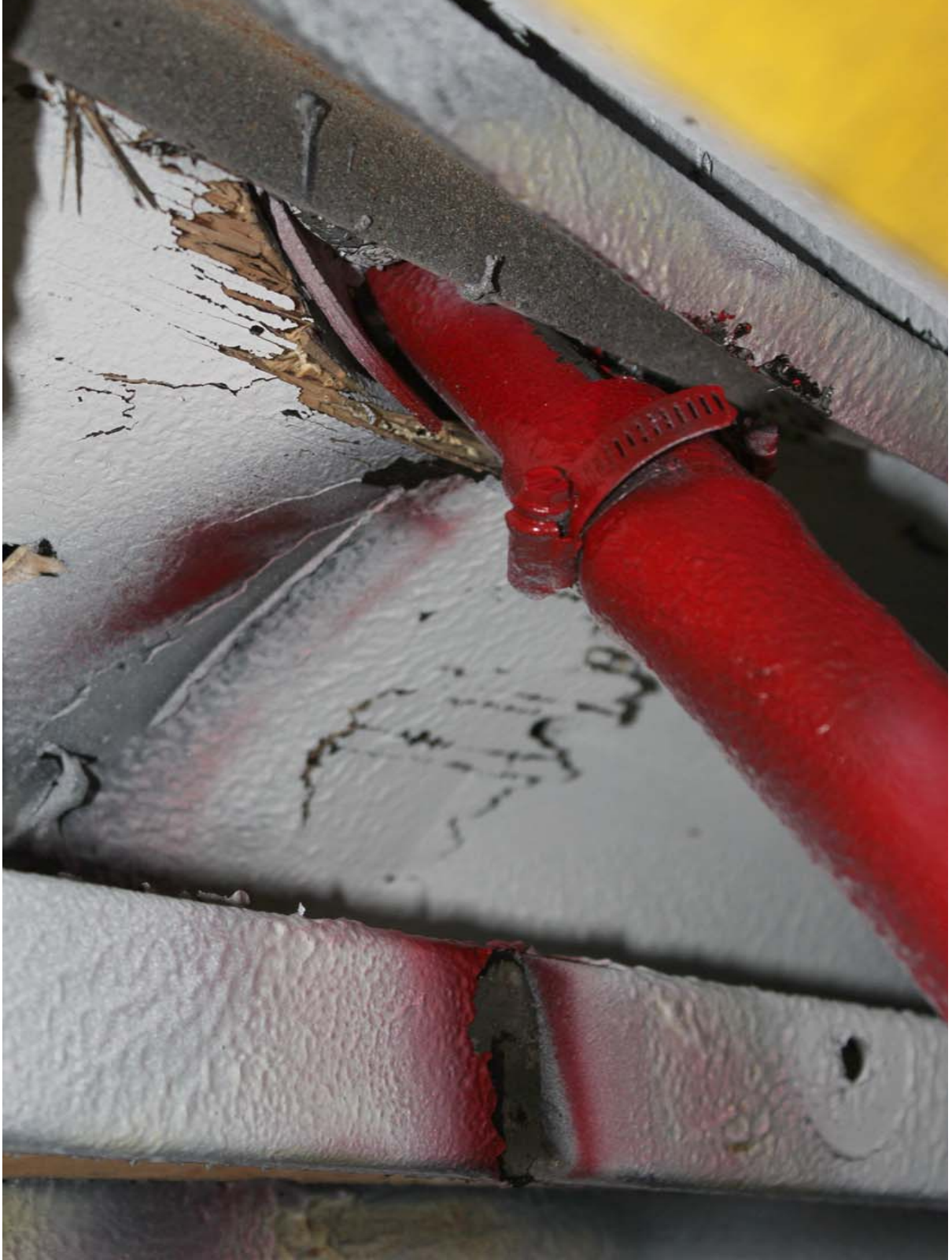
Post-Test Fuel Tank View 3

Test Vehicle: 2011 Starcraft Quest School Bus NHTSA No.: CB0902
Test Lab: MGA Research Corporation Test Date: 10/13/11



Post-Test Damage View 1

Test Vehicle: 2011 Starcraft Quest School Bus NHTSA No.: CB0902
Test Lab: MGA Research Corporation Test Date: 10/13/11



Post-Test Damage View 2

Test Vehicle: 2011 Starcraft Quest School Bus NHTSA No.: CB0902
Test Lab: MGA Research Corporation Test Date: 10/13/11



Post-Test Damage View 3

Test Vehicle: 2011 Starcraft Quest School Bus NHTSA No.: CB0902
Test Lab: MGA Research Corporation Test Date: 10/13/11



Post-Test Damage View 4

Test Vehicle: 2011 Starcraft Quest School Bus NHTSA No.: CB0902
Test Lab: MGA Research Corporation Test Date: 10/13/11



Post-Test Damage View 5

Test Vehicle: 2011 Starcraft Quest School Bus
Test Lab: MGA Research Corporation

NHTSA No.: CB0902
Test Date: 10/13/11



Pre-Test View of Ballast Weight View 1

Test Vehicle: 2011 Starcraft Quest School Bus
Test Lab: MGA Research Corporation

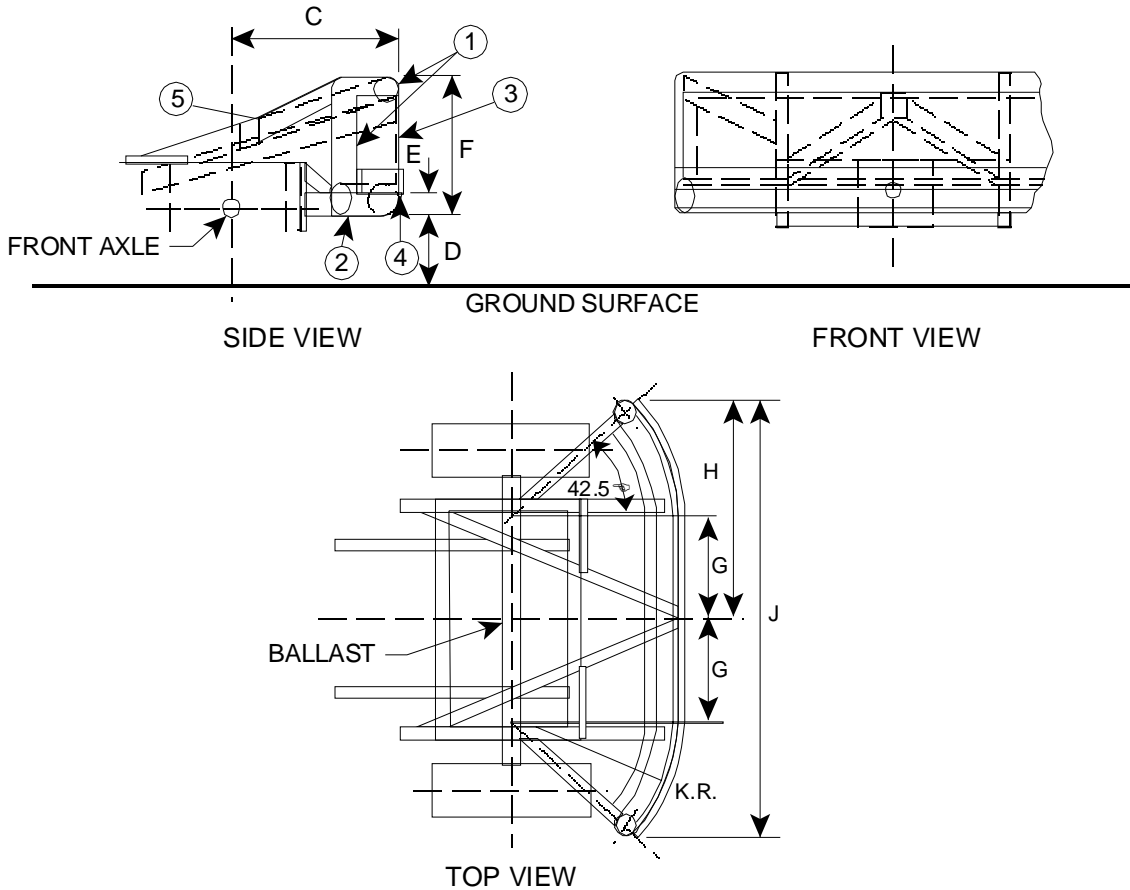
NHTSA No.: CB0902
Test Date: 10/13/11



Pre-Test View of Ballast Weight View 2

SECTION 5
BARRIER INFORMATION

CONTOURED IMPACT SURFACE FOR COMMON CARRIAGE



DIMENSIONS SHOWN IN TABLE ON NEXT PAGE

NOTES:

1. Upper Frame 4.0 in. dia x 0.25 in. wall (102 mm dia x 6 mm wall)
Steel Tubing (3 Sides)
2. Lower Frame 6.0 in. dia x 0.50 in. wall (152 mm dia x 13 mm wall)
Steel Tubing
3. Face Plate 0.75 in. (19 mm) thick cold rolled steel
4. Leading Edge 1.0 s 4.0 in. (25 x 102 mm) steel band, sharp
edges broken
5. All Inner Reinforcements 4.0 x 2.0 x 0.19 in. (102 x 51 x 5 mm)
steel tubing

Total Weight = 4,000 ± 50 lbs (1,814.1 ± 22.7 kg)

Weight at each Rear Wheel =
900 ± 25 lbs (408.2 ± 11.3 kg)

Weight at each Front Wheel =
1,100 ± 25 lbs (499.0 ± 11.3 kg)

Moments of Inertia:

$I_x = 271 \pm 13.6 \text{ slug-ft}^2 (367 \pm 18.4 \text{ kg-m}^2)$

$I_z = 3,475 \pm 174 \text{ slug-ft}^2 (4,711 \pm 236 \text{ kg-m}^2)$

SECTION 5
BARRIER INFORMATION

DIMENSIONS FOR CONTOURED IMPACT SURFACE

LETTER	INCHES	MILLIMETERS
A	54.0	1372
B	15.8	401
C	30.0	762
D	5.25	133
E	3.75	95
F	24.75	629
G	18.0	457
H	39.0	991
J	78.0	1981
K	30.0	762